

**UNITED STATES DISTRICT COURT
DISTRICT OF MAINE**

ED FRIEDMAN

Plaintiff,

CIVIL ACTION

v.

NO. NO. 20-cv-00237-JDL

CENTRAL MAINE POWER COMPANY,

Defendant.

**PLAINTIFF'S RESPONSE TO DEFENDANT'S STATEMENT OF UNDISPUTED
MATERIAL FACTS**

Plaintiff Ed Friedman responds to Defendant's Local Rule 56(b) *Statement of Undisputed Material Facts* as follows. Because there are several genuine issues of material fact, trial is necessary to resolve this litigation.

1. CMP measures its customers' electricity usage through meters placed on their homes.

Complaint ¶16.

Response: Admitted.

2. In 2007, CMP sought approval from the Maine Public Utilities Commission (hereinafter "Commission" or "MPUC") to implement an Advanced Metering Infrastructure ("AMI"). Maine PUC, Docket Nos. 2010-345, 2010-389, 2010-398, 2010-400 & 2011-085, Order (Part II) (June 22, 2011) (hereinafter "Opt-Out Order Part II") (citing Order Approving Installation of AMI Technology, Docket No. 2007-215(II) (Feb. 25, 2010)) (Joint Record, ECF 137-3 at 2).

Response: Admitted.

3. AMI allows for automated and remote meter reading, detailed customer usage measurement and data storage, and communications to and from customer meters. Opt-Out Order Part II at 2 (Joint Record, ECF 137-3 at 2).

Response: Admitted.

4. In 2010, the MPUC approved the installation of AMI technology. Opt-Out Order Part II at 2 (citing Order Approving Installation of AMI Technology (Joint Record, ECF 137-3 at 2).

Response: Admitted.

5. CMP's AMI system communicates and transmits data using a "mesh" network made up of individual customer meters, wireless repeaters and other devices that have been installed throughout CMP's service territory. Opt-Out Order Part II, at 2 (Joint Record, ECF 137-3 at 2).

Response: Admitted.

6. A radio device in the meters communicates with other meters and network devices within a Neighborhood Area Network. Opt-Out Order Part II, at 2 (Joint Record, ECF 137-3 at 2).

Response: Admitted.

7. The Neighborhood Area Networks link to the Wide Area Network, which is a high capacity wireless communications network over CMP's entire service area that moves information to and from the Head End System, which is the "controller" for the AMI System, and coordinates information flows between CMP customers and CMP's Meter Data Management System. Opt-Out Order Part II, at 2-3 (Joint Record, ECF 137-3 at 2-3).

Response: Admitted.

8. The meters and other devices in the AMI network transmit data by sending radiofrequency (RF) signals between various points in the network. Opt-Out Order Part II, at 3 (Joint Record, ECF 137-3 at 3).

Response: Admitted.

9. There are numerous natural and man-made sources of electromagnetic fields to which humans are constantly exposed. Declaration of Benjamin Cotts (“Cotts Declaration”) ¶10.

Response: Qualified. The statement that such sources exist is not disputed, but disputed to the extent this statement implies that the exposure is of the type or intensity to have any bearing on the issues in this case.

10. Some forms of electromagnetic fields are commonly recognized as such, including wireless communication signals such as television and radio broadcast signals or cellular communication. Cotts Declaration ¶10.

Response: Qualified. The statement that such sources exist is not disputed, but disputed to the extent this statement implies that the exposure is of the type or intensity to have any bearing on the issues in this case.

11. Less readily apparent are the multitude of other natural electromagnetic field sources, with visible light being among the most common (but less well-recognized) natural sources of electromagnetic fields. Cotts Declaration ¶10.

Response: Qualified. The statement that such sources exist is not disputed, but disputed to the extent this statement implies that the exposure is of the type or intensity to have any bearing on the issues in this case.

12. Unrecognized sources of RF fields include virtually all objects, including humans and the earth, that are sources of electromagnetic fields. Cotts Declaration ¶11.

Response: Qualified. The statement that such sources exist is not disputed, but disputed to the extent this statement implies that the exposure is of the type or intensity to have any bearing on the issues in this case.

13. Hotter objects, such as the sun, produce visible light and ultraviolet rays in the visible and ultraviolet portions of the electromagnetic spectrum, respectively, whereas colder objects, such as the earth, produce fields in the infrared portion of the electromagnetic spectrum. Cotts Declaration ¶12.

Response: Qualified. The statement that such sources exist is not disputed, but disputed to the extent this statement implies that the exposure is of the type or intensity to have any bearing on the issues in this case.

14. Hot objects emit electromagnetic energy at higher frequencies than cold objects. Cotts Declaration ¶16.

Response: Qualified. The statement that there are varying frequencies of emissions is not disputed, but disputed to the extent this statement implies that the exposure is of the type or intensity to have any bearing on the issues in this case.

15. Scientists refer to the emission of electromagnetic fields from objects as a function of temperature as “blackbody radiation”, but a more common term is thermal or heat energy. Cotts Declaration ¶13.

Response: Admitted.

16. The term “radiation” simply means “energy propagated through space,” and is used to describe energy emitted from any particular source such as heat from a campfire, light from a flashlight, or the broadcast signal from an FM radio antenna. Cotts Declaration ¶21.

Response: Qualified. Not disputed that this is a broad description of “radiation,” but disputed to the extent that this statement implies that a flashlight or broadcast signal from an FM radio antenna is similar to the frequency and type emitted from a smart meter.

17. Scientists and engineers often describe electromagnetic fields in terms of one of their defining characteristics—their frequency. Cotts Declaration ¶17.

Response: Qualified. The statement is not disputed, but is also not phrased as a material fact capable of being admitted or denied.

18. Frequency is determined by the rate at which the field changes strength and direction every second (i.e., the cycles per second expressed as Hertz [Hz]). Cotts Declaration ¶18.

Response: Admitted.

19. The many different frequencies of electromagnetic fields are described together in what scientists refer to as the electromagnetic spectrum which includes all forms of electromagnetic energy, including RF fields associated with wireless communication devices. Cotts Declaration ¶19.

Response: Qualified. The statement is not disputed, but is also not phrased as a material fact capable of being admitted or denied.

20. The fields in the electromagnetic spectrum are broadly classified as either non-ionizing radiation or ionizing radiation, based on their frequency. Cotts Declaration ¶¶20 & 22-23.

Response: Admitted.

21. X-rays and gamma rays are sources of ionizing radiation that have very high frequency fields and the ability to break molecular bonds and ionize atoms, which makes them “ionizing” radiation. Cotts Declaration ¶22.

Response: Admitted.

22. At the opposite end of the electromagnetic frequency spectrum, non-ionizing radiation includes ELF fields (just above the 0-Hz static geomagnetic field of the earth) associated with power infrastructure such as distribution and transmission lines, as well as RF fields. Cotts Declaration ¶23.

Response: Admitted.

23. Both ELF and RF fields are at the lower frequency end of the electromagnetic spectrum, and neither are energetic enough to break molecular bonds, which makes them “non-ionizing.” Cotts Declaration ¶23

Response: Qualified. Several terms used in this statement are too vague without context to be admitted or denied.

24. ELF fields associated with power infrastructure used in North America occur at a frequency of 60 Hz. Cotts Declaration ¶24.

Response: Admitted.

25. RF fields such as those of the CMP smart meters operate at a frequency of 2,400,000,000 Hz (i.e., 2.4 gigahertz [GHz]). Cotts Declaration ¶24.

Response: Admitted.

26. The term “duty cycle” describes the percentage of time any given source of energy transmits. Cotts Declaration ¶26.

Response: Admitted.

27. Most of the electromagnetic energy emitted by human beings and the earth is in the infrared portion of the electromagnetic spectrum (i.e., heat energy). Cotts Declaration ¶27.

Response: Qualified. Not disputed as a broad statement, but disputed to the extent that the statement implies that the electromagnetic energy emitted by human beings and the earth is similar in effect to energy emitted from smart meters.

28. A very small portion of the energy emitted by a human body, and the earth itself, however, is also emitted in the radio and microwave portions of the electromagnetic spectrum, making humans and the earth are naturally-occurring sources of RF. Cotts Declaration ¶27.

Response: Qualified. Not disputed as a broad statement, but disputed to the extent that the statement implies that the electromagnetic energy emitted by human beings and the earth is similar in effect to energy emitted from smart meters.

29. The duty cycle of both the human body and the earth is 100%. Cotts Declaration ¶28.

Response: Qualified. Not disputed as a broad statement, but disputed to the extent that the statement implies that the particular duty cycle of the human body and the earth is similar in effect to or has any bearing on the emissions produced by smart meters.

30. Man-made sources of RF include devices used for communications, such as cell phones, cordless phones, Wi-Fi, and Bluetooth devices. Cotts Declaration ¶29.

Response: Qualified. Not disputed as a broad statement, but disputed to the extent that the statement implies that Plaintiff is exposed to those sources in any significant way, as he would be with a smart meter. Further responding, Plaintiff does not have any cell phones, cordless phones, Wi-Fi, or Bluetooth devices in his home. The only manmade RF-emitting device in Plaintiff's home is a television remote.

31. Cell phones, cordless phones, Wi-Fi, and Bluetooth devices produce relatively weak fields, but because they are often used in very close proximity to the individual they may result in higher exposures than remote, but more powerful, sources such as amplitude-modulated

(AM) radio signals, frequency-modulated (FM) radio signals, or television broadcast signals. Cotts Declaration ¶30.

Response: Admitted.

32. Evaluation of RF exposure depends not only on the strength of a particular source (of which there are many), but importantly, also on the distance from the source and the duration of the exposure. Cotts Declaration ¶35.

Response: Qualified. Not disputed as a broad statement, but disputed to the extent that this is presented as a complete analysis of the evaluation of RF exposure. This statement does not include several other factors, including specific absorption, power density, pulse modulations, location, emission type (i.e. conducted or airborne radiated), and other factors.

33. The potential RF exposure from a CMP smart meter is substantially less than the RF exposure from common natural and man-made sources, as well as exposures from RF sources pertinent to the Proceeding. Cotts Declaration ¶36.

Response: Qualified, as this is a misleading statement as written as it does not take into account the particular exposure risk at Plaintiff's home, and that "exposures from RF sources pertinent to the Proceeding" is too vague a statement to respond to.

34. Some of the most commonly encountered sources of RF exposure are the naturally occurring RF fields from the earth and from the human body, both of which produce substantially higher exposure to RF than a CMP smart meter. Cotts Declaration ¶37.

Response: Qualified, as this is a misleading statement as written since naturally occurring RF fields (which humans have evolved with over thousands of years) affect the human body in distinct ways from manmade RF fields.

35. The RF exposure from a smart meter operating with a duty cycle of 0.05% (much greater than was experimentally determined) to a person located 1 yard away in front of the meter is about 8.7 times lower than the natural RF exposure from earth and about 20 times lower than the natural RF exposure from the human body. Cotts Declaration ¶37.

Response: Qualified, as this is a misleading statement as written since naturally occurring RF fields (which humans have evolved with over thousands of years) affect the human body in distinct ways from manmade RF fields.

36. In addition to these two natural sources, Mr. Friedman is continuously exposed to the RF emissions from numerous other sources, including from nearby television stations such as WCBB, WGME-TV, and WPFO, as well as RF emissions from nearby local radio stations such as WBCI, WCLZ, WMEY, and WARX. Cotts Declaration ¶38.

Response: Qualified, as this is a misleading statement as written. CMP has not conducted any testing at Mr. Friedman's property which could support this statement and any assertions regarding television station emissions is purely hypothetical. Further answering, Mr. Friedman takes extraordinary measures to reduce his risk of exposure from sources out of his control.

37. RF exposure inside Mr. Friedman's residence from these local broadcast towers, which have a duty cycle near 100%, i.e., they are always "on," is approximately 3,800 times greater than the potential exposure from a typical CMP smart meter. Cotts Declaration ¶39.

Response: Denied. CMP has not conducted any testing at Mr. Friedman's property which could support this statement.

38. RF exposure from approximately 5 minutes of aviation communication (in a 30-minute period) is approximately 40,500 times greater than the potential exposure from a typical CMP smart meter during the same 30-minute period. Cotts Declaration ¶40.

Response: Denied. CMP has not conducted any testing on Mr. Friedman's aircraft which could support this statement. Further answering, on a typical five-hour flight Mr. Friedman uses his communication system for approximately 30 seconds, total.

39. Three minutes of RF exposure (in a 30-minute period) from a solar panel inverter at 1 yard away is approximately 2,400 times greater than the potential exposure from a typical CMP smart meter during the same 30-minute period. Cotts Declaration ¶41.

Response: Qualified, as this statement is completely devoid of context. Further answering, Mr. Friedman has taken measures to significantly if not completely reduce his exposure to any solar panel inverter emissions on his property.

40. The smart meters operated by CMP would represent a negligible contribution to Mr. Friedman's overall RF exposure. Cotts Declaration ¶42.

Response: Denied. CMP's smart meters typically issue thousands of transmissions per day, creating a 24/7 exposure for Mr. Friedman. This would be a drastic increase in his overall exposure.

41. The RF exposures from other common sources are many times greater than from a typical CMP smart meter. Cotts Declaration ¶43.

Response: Denied. This statement is devoid of specific information which would warrant a response, but the effect of CMP smart meter exposure on the human body is significant, even compared to other common sources.

42. The magnitudes of the RF exposure from other RF sources to which Mr. Friedman has previously or currently chosen to expose himself are hundreds to thousands of times greater than from a typical CMP smart meter. Cotts Declaration ¶44.

Response: Denied. This statement is devoid of specific information which would warrant a response, but the effect of CMP smart meter exposure on the human body is significant, even compared to other common sources.

43. The contribution of a typical CMP smart meter to the RF exposure indoors of Mr. Friedman during a 30-minute measurement averaging period used by the Federal Communications Commission (FCC) would be about 0.0000040% (1/25,000,000th) of the FCC's health-based exposure limit. Cotts Declaration ¶45.

Response: Denied. CMP has not conducted any testing at Mr. Friedman's property which could support this statement.

44. The Plaintiff is a helicopter pilot. Friedman Depo. at 9:20-23 & 24:10-28:5 (Joint Record, ECF 137-20 at 3 & 6-7).

Response: Qualified. Not disputed that Mr. Friedman does occasionally operate a helicopter, but denied to the extent that this statement suggests he does so at any significant frequency.

45. RF exposure from approximately 5 minutes of aviation communication (in a 30-minute period) is approximately 40,500 times greater than the potential exposure from a typical CMP smart meter during the same 30-minute period. Cotts Declaration ¶40.

Response: Denied. The RF exposure from helicopters and airplanes varies significantly between models, how they are equipped, and the airspace in which they are flown. CMP has not performed any testing which would support this statement. Further answering, Mr.

Friedman only uses aviation communication for approximately 30 seconds throughout a five-hour flight.

46. The Plaintiff has a solar panel inverter, which emits RF, at his home. Friedman Depo. at 20:21-22:5 (Joint Record, ECF 137-20 at 6).

Response: Qualified. Not disputed that Mr. Friedman has a solar panel inverter at his home, but disputed to the extent that this implies that he has not taken extreme measures to reduce if not completely eliminate his exposure.

47. Three minutes of RF exposure (in a 30-minute period) from a solar panel inverter at 1 yard away is approximately 2,400 times greater than the potential exposure from a typical CMP smart meter during the same 30-minute period. Cotts Declaration ¶41.

Response: Qualified. Not disputed as a general statement, but disputed to the extent that this implies that Mr. Friedman has not taken extreme measures to reduce if not completely eliminate his exposure.

48. Since 1996, the FCC has promulgated “a set of guidelines for evaluating the environmental effects of RF exposure,” which includes limits for

- a. Specific absorption rate (SAR), the metric for highly-localized, close-in exposure at commonly-used frequencies; and
- b. Maximum permissible exposure (MPE), the measure for more- distant, whole-body exposure and for whole-body exposure at higher frequencies.

Resolution of Notice of Inquiry, Second Report and Order, Notice of Proposed Rulemaking, and Memorandum Opinion and Order, Adopted Nov. 27, 2019, in Federal Communications Commission #FCC 19-126 (hereinafter FCC 2019 RF Order) at 3-4 (Joint Record, ECF 137-

12 at 3-4); see also Report and Order dated Aug. 1, 1996, in Federal Communications Commission, #FCC 96-326 (Joint Record, ECF 137-1).

Response: Qualified. Not disputed that the FCC has promulgated such guidelines, but this statement as presented in a vacuum lacks any context which would make it meaningful as to this case.

49. Because “smart meters are designed generally to be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter’s radiating structure(s) and the bodies of any nearby persons [they] qualify for exposure evaluation using MPE limits rather than SAR limits.” FCC 2019 RF Order at 18-19 n. 92 (Joint Record, ECF 137-12 at 18-19 n.92).

Response: Qualified. The MPE limits average exposure over a 30-minute period, which is an inaccurate way of measuring individual RFR micropulsing.

50. CMP ensures that its smart meters comply with the FCC’s RF exposure limits by having the meters tested and evaluated in certified laboratories. Maine PUC, Docket Nos. 2011-00262 & 2012-00412, Order re: Safety of Advanced Metering Infrastructure (AMI) (hereinafter ‘PUC December 19, 2014 Order’) at 16 (Joint Record, ECF 137-10 at 16).

Response: Admitted.

51. The contribution of a typical CMP smart meter to the RF exposure indoors of Mr. Friedman during a 30-minute measurement averaging period used by the Federal Communications Commission (FCC) would be about 0.0000040% (1/25,000,000th) of the FCC’s health-based exposure limit. Cotts Declaration ¶45.

Response: Denied. Such a calculation would require an analysis of Mr. Friedman’s home, which has not been conducted.

52. On October 25, 2010, the Commission received a complaint alleging that:

- a. The non-ionizing RF radiation that would be emitted by the smart meter mesh network could be a potential cause of cancer;
- b. There are individuals who suffer from medically confirmed sensitivities to non-ionizing RF radiation who would be exposed to such radiation involuntarily under CMP's smart meter program; and
- c. Therefore, CMP's acts and practices with respect to the installation of smart meters were unreasonable, inadequate and inconsistent with legislative mandates.

Opt-Out Order Part II, at 3 (Joint Record, ECF 137-3 at 3).

Response: Qualified. Not disputed that this is a partial statement of the complaint.

53. In response to this complaint, CMP stated that:

- a. There was no credible support for an assertion that the extremely low power and intermittent RF transmissions emitted by its AMI devices could have any adverse health effects on any customer;
- b. The use of AMI devices is approved under the standards for RF by the Federal Communications Commission (FCC), the entity charged by Congress with ensuring the safety of transmitting devices, and the emissions levels are far below those found by the FCC to be safe for RF exposure; and
- c. Claims that customers may become sick from radiation in the form of RF emitted from smart meters and associated technologies are not supported by the scientific community.

Opt-Out Order Part II, at 3 (Joint Record, ECF 137-3 at 3).

Response: Qualified. Not disputed that this is a partial statement of CMP's response.

54. The MPUC conducted an investigation of the complaint (hereinafter "the "Opt-Out Investigation"), limited to the issue of whether CMP's position of not providing opt-out alternatives in its smart meter installation program was "unreasonable, insufficient or unjustly discriminatory" in the context of the February 25, 2010 Order Approving Installation of AMI Technology. Opt-Out Order Part II, at 7 (Joint Record, ECF 137-3 at 7).

Response: Admitted.

55. In initiating the Opt-Out Investigation, the Commission specifically stated that it was making no determination on the merits of health concerns with respect to wireless smart meters. Opt-Out Order Part II, at 7 (Joint Record, ECF 137-3 at 7).

Response: Admitted.

56. At the conclusion of its investigation, the MPUC directed CMP to allow customers to opt out of AMI, either by using their existing meters or by using smart meters. In non-transmitting mode. Opt-Out Order Part II, at 11-18 (Joint Record, ECF 137-3 at 11-18).

Response: Admitted.

57. The MPUC provided that customers choosing to opt out of AMI would bear the incremental cost of doing so, with their costs depending on whether they selected the existing meter option or the transmitter-off option. Opt-Out Order Part II, at 14 (Joint Record, ECF 137-3 at 14).

Response: Admitted.

58. The MPUC explained as follows its rationale for requiring that customers who opt out of AMI bear the incremental cost of exercising that option:

The AMI smart meters are now CMP's standard meter. It has been the practice in Maine that customers that desire alternatives to the utility's

standard meters pay the incremental costs of the alternative metering. See, e.g., Chapter 322, §5(A)(2). We see no reason to change this practice in the context of CMP's smart meter program. As a general utility ratemaking principle, customers that request non-standard services should pay the incremental costs of those services. In our view, it would be inconsistent with ratemaking principles and basically inequitable for CMP to recover the costs caused by an individual customer's decision to opt-out of receiving a standard wireless meter from its general body of ratepayers.

Opt-Out Order Part II, at 14 (Joint Record, ECF 137-3 at 14).

Response: Qualified. Not disputed that this is a quote from the Opt-Out Order, but disputed to the extent that the statement implies that it is a full and complete accounting of MPUC's rationale.

59. Since 2011, CMP's customers have been able to choose between having a "smart" meter which emits radiofrequency radiation (RFR) through airborne and conducted emissions, a "smart" or solid state (digital) meter without transmitter which still emits RFR conducted emissions or an analog meter, which does not. Stipulation of Material Facts ¶9.

Response: Admitted.

60. Under Section 12.11 of CMP's Terms & Conditions, a customer who wishes to opt out of the smart meter program for an analog or solid-state meter must pay an Initial Charge of \$40, plus a Recurring Monthly Charge. Stipulation of Material Facts ¶10.

Response: Admitted.

61. The smart meter without transmitter initial charge is \$20. Stipulation of Material Facts ¶11.

Response: Admitted.

62. The Recurring Monthly charge was \$16.05 per month as of July 1, 2020, and \$18.06 per meter beginning as of July 1, 2023. Recurring charge for the smart meter without transmitter is \$16.09 as of July 1, 2023. Stipulation of Material Facts ¶12.

Response: Admitted.

63. The Recurring Monthly charge is expected to increase over time, although the amounts of future increases are unknown. Stipulation of Material Facts ¶13.

Response: Admitted.

64. The Plaintiff, Ed Friedman, was opposed to smart meters for many reasons before he ever came to believe that his cancer made him unusually susceptible to the effects of RF radiation. Friedman Depo. at 50:25-51:4 (Joint Record, ECF 137-20 at 13).

Response: Qualified. Not disputed as a general statement, but disputed to the extent that the phrasing implies that Mr. Friedman's cancer treatment would not be adversely affected by RF radiation, or that Mr. Friedman is somehow not protected by federal anti-discrimination laws because of his advocacy.

65. Mr. Friedman's reasons for opposing smart meters included:

- a. His belief that they have a general negative effect on public health. Friedman Depo. at 51:5-8 (Joint Record, ECF 137-20 at 13);
- b. His belief that they constitute an electronic trespass, Friedman Depo. at 51:9-11 (Joint Record, ECF 137-20 at 13);
- c. His belief that they have an adverse effect on privacy, Friedman Depo. at 51:12-16 (Joint Record, ECF 137-20 at 13).

Response: Qualified. Not disputed that those are some reasons Mr. Friedman opposes smart meters, but disputed that his beliefs are material to the issues on summary judgment.

66. Mr. Friedman opted out of AMI before he was diagnosed with cancer. Friedman Depo. at 68:19-25 (Joint Record, ECF 137-20 at 17).

Response: Admitted.

67. The impetus for Mr. Friedman's decision to opt out of AMI was not a recommendation from a doctor. Friedman Depo. at 68:19-25 (Joint Record, ECF 137-20 at 17).

Response: Qualified. Not disputed, except to the extent that the phrasing implies that Mr. Friedman's cancer treatment would not be adversely affected by RF radiation or that he somehow should have had a recommendation from his doctors prior to his cancer diagnosis..

68. When Mr. Friedman opted out of AMI, no doctor had ever told him that his fatigue, or any other symptom related to his cancer, was exacerbated by exposure to RF radiation. Friedman Depo. at 70:16-21 (Joint Record, ECF 137-20 at 18).

Response: Qualified. Not disputed, except to the extent that the phrasing implies that Mr. Friedman's cancer treatment would not be adversely affected by RF radiation or that he somehow should have had a recommendation from his doctors prior to his cancer diagnosis.

69. Regardless of whether he had been diagnosed with cancer, Mr. Friedman would not have a smart meter on his property. Friedman Depo. at 51:21-52:3 & 80:22-81:6 (Joint Record, ECF 137-20 at 13 & 20-21).

Response: Admitted.

70. In July 2011, Ed Friedman and eighteen other CMP customers filed a complaint with the MPUC against both the Commission and CMP pursuant to 35-A M.R.S.A. § 1302 (2011). Friedman Depo. Exhibit 1 (Joint Record, ECF 137-21 at 1-52).

Response: Admitted.

71. In the complaint, Friedman alleged that AMI was unsafe, and requested that the Commission "open an investigation" to consider "new and important evidence specifically

addressing non-ionizing radiation of the type emitted by smart meters,” which the complaint noted had been published since the Commission issued its Opt–Out Orders. Friedman Depo. Exhibit 1 at 5 (Joint Record, ECF 137-21 at 5).

Response: Admitted.

72. The Commission dismissed Friedman’s complaint, without a hearing, by an Order dated August 31, 2011. Friedman v. Maine Public Util. Comm’n, 2012 ME 90, 48 A.3d 794 (Friedman v. PUC I), ¶¶4-5.

Response: Admitted.

73. In its August 31, 2011 Order, the Commission concluded: “All of the issues raised by the complainants in this matter were raised by one or more of the complainants in the Opt–Out Investigation and were considered by the Commission and resolved during that investigation or in subsequent orders on motions for reconsideration.” *Friedman v. PUC I*, ¶¶4-5.

Response: Qualified. Not disputed that this is a quote from the order, but this is not a material statement of fact, as presented.

74. On appeal, the Law Court vacated in part the MPUC’s dismissal of Friedman’s complaint, reasoning that although the Commission had “considered, to a limited extent, the health and safety issues Friedman raised, . . . it did not resolve those issues,” and therefore was “in no position to conclude . . . that requiring customers who elect either of the opt-out alternatives to pay a fee is not ‘unreasonable or unjustly discriminatory.’” *Friedman v. PUC I*, ¶11.

Response: Qualified. Not disputed that this is a quote from the order, but this is not a material statement of fact, as presented.

75. On remand, the MPUC initiated an investigation and conducted extensive discovery. Dec. 19, 2014 Order at 11 (Joint Record, ECF 137-10 at 11).

Response: Qualified. Not disputed that some discovery was conducted, but disputed to the extent that “extensive” is not defined.

76. In the course of its investigation the Commission considered over one hundred peer-reviewed scientific studies, Dec. 19, 2014 Order at 11 (Joint Record, ECF 137-10 at 11); an investigation performed by the Maine Centers for Disease Control, id. at 74-75 (Joint Record, ECF 137-10 at 11); exposure regulations in the United States and Canada, id. at 76-78 (Joint Record, ECF 137-10 at 76-78); data showing that smart meters comply with RF exposure regulations promulgated by the FCC, id. at 35 & 64 (Joint Record, ECF 137-10 at 35 & 64); and “extensive field-testing of smart meters,” id. at 65-67 (Joint Record, ECF 137-10 at 65- 67).

Response: Qualified. It is not disputed that the Commission did review such studies, but this is misleading to the extent that it does not reflect the Commission’s rejection of close to 1,000 peer-reviewed studies submitted by appellants.

77. The Commission made the following finding with respect to the Maine CDC investigation:

The Maine Center for Disease Control (Maine CDC) issued a report on November 8, 2011, regarding health issues related to smart meters. Maine CDC, "Maine CDC Executive Summary of Review of Health Issues Related to Smart Meters" (Nov. 8, 2010) (Maine CDC Report). The report concluded "that studies to date give no consistent or convincing evidence of a causal relation between RF exposure in the range of frequencies and power used by smart meters and adverse health effects." Maine CDC Report at 3. The Maine CDC did not make a safety finding.

Dec. 19, 2014 Order at 49 (Joint Record, ECF 137-10 at 49)

Response: Qualified. This is a portion of the finding, but does not provide important context, such as the problems with CDC staff’s research and other information.

78. In the course of its investigation, the MPUC also received pre-filed testimony, and ultimately Conducted two days of live testimonial hearings. Dec. 19, 2014 Order at 10 & 11 (Joint Record, ECF 137-10 at 10 & 11).

Response: Admitted.

79. In the course of the Opt-Out investigation CMP submitted an RF monitoring field study, "Measurement Validation of Exposure Predications from Central Maine Power Smart Meter Network" conducted by Dr. Yakov Shkolnikov (Exponent Study). Dec. 19, 2014 Order at 10 (Joint Record, ECF 137-10 at 10).

Response: Admitted.

80. In the course of the Opt-Out investigation the Office of the Public Advocate (OPA) submitted an RF monitoring field study, prepared by True North Associates and C2 Systems. Dec. 19, 2014 Order at 10 (Joint Record, ECF 137-10 at 10); ECF 137-9).

Response: Admitted.

81. The Commission made the following findings with respect to the duty cycle of CMP's smart meters:

With sixty descendants, a smart meter would transmit "stay alive" signals each day for approximately 6.24 seconds (61×4.26 milliseconds \times 24 hours), and energy usage signals each day for approximately 2.6 seconds (61×42.6 milliseconds) for a total signal duration of approximately 8.8 seconds per day. The vast majority of CMP's smart meters transmit for much shorter periods each day, and the average smart meter on CMP's system transmits for a total of approximately 4.4 seconds per day. Boxer-Cook et al., Docket No. 2010-00345, Data Request ODR-01-29. For those meters that are in the highest one-percentile in terms of number of daily signals transmitted, i.e., meters that have more than sixty descendants, testing demonstrated that the meters transmitted an average of approximately 35,000 signals per day. Data Request DW 01-97. At 4.26 milliseconds per signal, this is approximately 149 seconds, or 2.5 minutes per day. According to CMP, longer transmissions for software and firmware updates are expected to occur twice each year. Exponent Testimony at 4. However, due to programming and other constraints, in no event can a smart

meter have more than 4,998 descendants or have a "duty cycle" (the percentage of time the smart meter can transmit) of more than 10%. Exponent Study at 11; Exponent Testimony at 4. Therefore, a smart meter cannot be sending an RF signal for more than 144 minutes each day (3 minutes out of any thirty minute period).

Dec. 19, 2014 Order, at 13 (Joint Record, ECF 137-10 at 13).

Response: Admitted.

82. The Commission made the following findings with respect to the field studies that were performed for CMP and OPA:

[A]ctual field tests of the CMP AMI meters and other smart meters suggest RF exposures from smart meters are less than those from cellular phones and therefore exhibit a substantial margin of safety. The OPA conducted field tests of three smart meter sites plus two repeater sites. OPA's study would have picked up all sources of RF radiation. At one site with three smart meter banks, the OPA's consultant found an RF level of 13.4% of the FCC maximum exposure limit for the general population. Exponent conducted field testing of three smart meter sites which could not detect any RF. Notably, the OPA's measure is only one order of magnitude below the FCC limit rather than two to three orders of magnitude predicted by CMP's experts. This is likely attributable to multiple meters and other sources of RF, but this does point to the importance of fully assessing the impacts of large installations of meters.

Dec. 19, 2014 Order at 48 (Joint Record, ECF 137-10 at 48).

Field tests of CMP's smart meters in operation tend to confirm laboratory testing and calculated RF exposure levels. Both the OPA and Exponent conducted field tests and the results of both studies support the conclusion that the exposure levels from CMP's smart meters and related equipment are below the ICNIRP, Canadian, FCC and other jurisdictions' limits.

Dec. 19, 2014 Order at 50 (Joint Record, ECF 137-10 at 50).

Response: Qualified to the extent this implies that limits set by FCC, ICNIRP and various other agencies are relevant to disability discrimination legislation and individual disability accommodations.

83. At the hearing before the MPUC, Friedman presented testimony of Dr. Lennart Hardell, purporting to describe a plausible mechanism by which exposure to low-level RF, such as that emitted by smart meters, can cause cancer – specifically, that oxidative stress caused by the propagation of reactive oxygen species (“ROS”) can lead to DNA base damage. Pre-Filed Testimony of Dr. Lennart Hardell, dated January 31, 2013 (“Hardell Testimony”), in Maine Public Utilities Commission, Docket No. 2011-262 (Joint Record, ECF 137-5).

Response: Admitted.

84. Dr. Hardell, appearing on behalf of Friedman, testified in part as follows:

[A] recently published study showed that 2.45 GHz low-level RF-EMF radiation induced oxidative stress and suppressed implantation or pregnancy in mice. It was also concluded that it might lead to deformity of the embryo in case pregnancy continues. The oxidative stress may lead to DNA strand breakage in the brain according to the authors and thus be a mechanism for causation of brain tumors. The effects were non-thermal at power density $\wedge 0.033549 \text{ mW/cm}^2$, and specific absorption rate (SAR) 0.023023 W/kg (Shahin et al 2013).

Antioxidants such as melatonin, vitamin C and vitamin E can alleviate the ROS oxidation and apoptosis that are induced by RF-EMF in an animal model (Oral et al 2006, Ozguner et al 2006).

The results in the study by Liu et al (2013) and Shahin et al (2013) are important findings to further elucidate the mechanisms for RF-EMF genotoxicity. These effects are clearly non-thermal. In summary these and other studies show that oxidative stress is an important mechanism for adverse health effects from RF-EMF emissions.

Non-thermal effects of electromagnetic fields on living systems have been further discussed in a monograph from the Ramazzini Institute (Giuliani, Soffritti 2010).

http://www.icems.eu/papers/ramazzini_libraryS_part1.pdf

http://www.icems.eu/papers/ramazzini_library5_part2.pdf

Hardell Testimony at 18-19 (Joint Record, ECF 137-5 at 18-19).

Response: Admitted.

85. Dr. Hardell testified on behalf of Friedman that the oxidative stress in mice which had been found in the Shahin study was relevant to the Public Utilities Commission's analysis of the health effects of CMP smart meters. Hardell Testimony at 18-20 (Joint Record, ECF 137-5 at 18-20).

Response: Qualified. Not disputed that Dr. Hardell generally testified as described, but disputed to the extent that this is offered as a complete summation of his testimony.

86. CMP presented the following testimony rebutting the Hardell testimony:

Q. On page 18 of testimony, Dr. Hardell cites a study by Shahin et al. (2013) and states: "Another recently published study showed that 2.45 GHz low-level RF- EMF radiation induced oxidative stress and suppressed implantation or pregnancy in mice. It was also concluded that it might lead to deformity of the embryo in case pregnancy continues. The oxidative stress may lead to DNA strand breakage in the brain according to the authors and thus be a mechanism for causation of brain tumors. The effects were non-thermal at power density = 0.033549 mW/cm², and SAR = 0.023023 W/kg" (emphasis added). Does the Shahin et al. (2013) study provide evidence of adverse effects that can be extrapolated to exposure to RF fields from smart meters?

A. No. First, Dr. Hardell fails to note that CMP smart meter exposures are thousands of times lower than 0.033549 mW/cm², and that results from Shahin et al. (2013) may not be observed at such lower-level exposures. Moreover, as ICNIRP1 states, based on a review of the scientific literature, "Overall, the data are consistent and suggest that RF exposure has no effect on ROS [reactive oxygen species, indicators of oxidative cell stress] production in several different cell lines" (ICNIRP, 2009, Section II.3.3.3). Thus, a systematic review of the literature—in contrast with the selective citation of a single finding that RF exposure "might" or "may" cause injury—does not support the effect that Dr. Hardell claims here.

Maine PUC, Docket No. 2011-00262, CMP Rebuttal Testimony at 83-84 (Joint Record, ECF 137-8 at 83-84).

Response: Admitted.

87. At the hearing before the MPUC, Friedman also presented sworn testimony of Dr. David Carpenter. ECF 137-6 and 137-7.

Response: Admitted.

88. Dr. Carpenter, appearing on behalf of Friedman, testified as follows:

Some, but not all studies of isolated cells and intact animals have shown that RF/MW exposures may cause changes in cell membrane function, cell communication, metabolism, activation of proto-oncogenes, and can trigger the production of stress proteins at exposure levels below the above FCC and Health Canada guidelines. Resulting effects in cellular studies include DNA breaks and chromosome aberrations, cell death including death of brain neurons, increased free radical production, activation of the endogenous opioid system, cell stress and premature aging. Additional studies show neurologic, immune, endocrine, reproductive and cardiac, adverse health effects from low-dose, chronic exposure to RF/MW radiation in humans. These studies will not be presented here because there are too many and their relevance to human health is uncertain. Please see Bioinitiative Report. 2012 for a comprehensive review of these studies. *In summary they do provide additional evidence of biological effects and evidence for possible mechanisms whereby radiofrequency fields may cause adverse health effects including cancer, reproductive and neurobehavioral effects through generation of reactive oxygen species, gene induction and alteration of ion fluxes.* but not all positive observations have been fully replicated.

Maine PUC, Docket No. 2011-00262, Carpenter Testimony at 20 (Joint Record, ECF 137-6 at 20).

Response: Admitted.

89. In an Order dated December 19, 2014, the Commission found that “AMI, including the use of smart meters, as implemented and operated by CMP, does not present a credible threat of harm to the health and safety of CMP's customers and, based on the record of this proceeding is, therefore, safe.” Dec. 19, 2014 Order at 3 & 23 (Joint Record, ECF 137-10 at 3 & 23).

Response: Admitted.

90. The two Commissioners who joined in the decision took “slightly different approach[es] regarding customers with medical treatment recommendations to avoid the AMI meters.”

One Commissioner (Littell) would have had CMP provide “an AMI meter with transmitter off” as an option for customers who objected to RF exposure at any level, while the other (Vannoy) would not have imposed that requirement. However, “[b]oth Commissioner Littell and Commissioner Vannoy concur[red] that this difference in approach [did] not vitiate their concurrence regarding the safety of the AMI meters and network in use in Maine.” Dec. 19, 2014 Order at 23 (Joint Record, ECF 137-10 at 23).

Response: Admitted.

91. On appeal, the Law Court affirmed the decision of the PUC. *Friedman v. Public Utilities Comm'n*, 2016 ME 19, 132 A.3d 183 (2016) (hereinafter “*Friedman v. PUC II*”).

Response: Admitted.

92. In its opinion, the Court said:

- a. CMP was not required to “ensure” safety beyond all doubt;
- b. “[E]vidence of a hypothetical future risk is not sufficient to preclude a finding that CMP satisfied its burden; rather, the threat of harm must be probable and convincing.”
- c. Friedman had not established a “probable” threat of harm;
- d. The Commission had properly determined that “‘there have been no studies provided or cited that even purport to indicate negative health effects from the . . . RF exposure levels from smart meters;’” and
- e. Because the evidence in the record “was insufficient to conclude that smart meters amount to a credible threat of harm,” CMP had met its burden of proving that its system for delivering electricity was “safe.”

Friedman v. PUC II, ¶14 (citing December 19, 2014 Order at 69).

Response: Admitted.

93. In October or November of 2013, the Plaintiff was diagnosed with lymphoplasmacytic lymphoma, a form of lymphoma. Complaint ¶¶4 & 13; Friedman Depo. at 47:24-48:1 (Joint Record, ECF 137-20 at 12).

Response: Admitted.

94. On or about October 5, 2016, the Plaintiff presented his oncologist/hematologist, Dr. David Benton, with a letter he had written, which he asked Dr. Benton to sign in support of his request for a waiver of the CMP opt-out fee. Benton Depo. at 10:21-11:8 (Joint Record, ECF 137-18 at 4-5).

Response: Admitted.

95. Dr. Benton told Mr. Friedman that he was not comfortable with the letter, which said that exposure to smart meters would “exacerbate problems already experienced” by Friedman. Benton Depo. at 13:3-12 (Joint Record, ECF 137-18 at 5).

Response: Qualified. Not disputed that Dr. Benton engaged in a discussion with Mr. Friedman regarding the specific language in the letter.

96. Dr. Benton refused to sign the letter as drafted, “softening” the wording by adding the word “may” instead of drawing a causal connection between exposure to RF and Mr. Friedman’s disease and symptoms. Benton Depo. at 11:14-12:13 (Joint Record, ECF 137-18 at 4).

Response: Qualified. Not disputed that Dr. Benton engaged in a discussion with Mr. Friedman regarding the specific language in the letter.

97. Dr. Benton did eventually sign a letter, dated November 30, 2016, addressed “To Whom It May Concern,” stating:

My patient suffers from lymphoplasmacytic lymphoma, a type of non-Hodgkins lymphoma Waldenstrom’s Macroglobulinemia (WM), a medical

condition for which there is no cure. Treatment goals are to slow disease progression if possible. We are concerned that low-level non-ionizing radiation exposure of the type and level emitted by Electromagnetic Frequency (EMF) invoicing tools may exacerbate problems already experienced by my patient including fatigue, cognitive difficulties, memory issues and multiple cancer types. It is my recommendation Mr. Friedman's request for reasonable accommodation without penalty be granted to minimize his risk of disease progression symptoms exacerbation.

Benton Depo. Exhibit 2 (Joint Record, ECF 137-19 at 143).

Response: Admitted.

98. The reference in the letter to cognitive difficulties or memory issues was language authored by Mr. Friedman, not Dr. Benton. Benton Depo. at 12:15-19 (Joint Record, ECF 137-18 at 5).

Response: Qualified. Dr. Benton did approve the language ultimately included in the letter.

99. The reference in the letter to "multiple cancer types" was language authored by Mr. Friedman, not Dr. Benton. Benton Depo. at 12:20-22 (Joint Record, ECF 137-18 at 5).

Response: Qualified. Dr. Benton did approve the language ultimately included in the letter.

100. When he agreed to sign the letter, purportedly expressing his concern that low-level non-ionizing radiation emitted by a smart meter "may exacerbate problems already experienced by [Friedman] including fatigue, cognitive difficulties, memory issues and multiple cancer types," Dr. Benton in fact had no such concerns. Benton Depo. at 10:7-11 & 12:15-13:21 (Joint Record, ECF 137-18 at 4-5).

Response: Denied. Dr. Benton contradicted this testimony at deposition, in part in stating that "the definition of a symptom" is "self-complaint" (i.e. reported by the patient), including fatigue. Benton Depo. at 23:4-14.

101. When he agreed to sign the letter, Dr. Benton had never known Mr. Friedman to have problems with cognition or memory. Benton Depo. at 9:3-10:11 (Joint Record, ECF 137-18 at 4).

Response: Denied. Dr. Benton contradicted this testimony at deposition, in part in stating that “the definition of a symptom” is “self-complaint” (i.e. reported by the patient), including fatigue. Benton Depo. at 23:4-14. Mr. Friedman complained to Dr. Benton at the time that he presented the letter.

102. When Dr. Benton agreed to sign the letter, Mr. Friedman was not reporting that he was currently experiencing fatigue. Benton Depo. at 12:23-13:2 (Joint Record, ECF 137-18 at 5).

Response: Denied. Mr. Friedman complained about fatigue well before the letter was drafted. Joint Record, ECF 137-20 at 6:20-7:14 (Page ID #4548).

103. When he agreed to sign the letter, Dr. Benton had performed no research to support the proposition that exposure to RF may exacerbate any medical condition the Plaintiff had experienced. Benton Depo. at 13:13-17 (Joint Record, ECF 137-18 at 5).

Response: Qualified. Not disputed that he did not perform research specific to RF, but disputed because Dr. Benton’s general research and knowledge regarding the diagnosis and treatment of cancer, including the effect of stress, speaks directly to the exacerbation of Plaintiff’s medical condition.

104. When he agreed to sign the letter, Dr. Benton had performed no research to support the proposition that exposure to RF had any negative effect on the physical health of any human being. Benton Depo. at 15:6-16 (Joint Record, ECF 137-18 at 6).

Response: Admitted.

105. When he agreed to sign the letter, Dr. Benton had not formed the opinion that RF had any negative effect on the physical health of any human being. Benton Depo. at 15:6-16 (Joint Record, ECF 137-18 at 6).

Response: Qualified. Not disputed as a general statement, but disputed because Dr. Benton's general research and knowledge regarding the diagnosis and treatment of cancer, including the effect of stress, speaks directly to the exacerbation of Plaintiff's medical condition.

106. Dr. Benton signed the letter solely because he was concerned that Mr. Friedman was emotionally stressed by the prospect of having to live with a smart meter. Benton Depo. at 14:6-24 (Joint Record, ECF 137-18 at 5).

Response: Qualified. Dr. Benton also stated that such stress would have a negative impact on Plaintiff's diagnosis. ECF 137-18 at 14:6-24.

107. In the course of his practice, Dr. Benton had never before recommended to any patient that they not have smart meters in their homes. Benton Depo. at 13:22-25 (Joint Record, ECF 137-18 at 5).

Response: Admitted.

108. Mr. Friedman presented the November 30, 2016 letter to CMP as the basis for a request that CMP excuse him from having to pay the opt-out fee, as an accommodation of his cancer. Complaint ¶¶ 27-30.

Response: Admitted.

109. CMP declined Mr. Friedman's request. Deposition of Central Maine Power Company at 100:16-101:22 (Joint Record, ECF 137-30 at 25-26).

Response: Admitted.

110. After Mr. Friedman failed to pay the opt-out fees that accrued over a period of months, CMP disconnected his electrical service. Complaint ¶¶ 32-44.

Response: Qualified. Not disputed that Mr. Friedman did not pay the opt-out fees or that CMP disconnected his electrical service, but disputed that he “failed” to pay the fees, as no fees should have been owed following the request for accommodation and fee payment could be held in abeyance during the MPUC proceeding, pending its outcome.

111. In January 2017, Mr. Friedman filed a complaint with the Maine Human Rights Commission. Friedman Depo. Exhibit 9 (Joint Record, ECF 137-21 at 291).

Response: Admitted.

112. In a February 2, 2017 submission to the Maine Human Rights Commission, Friedman represented that his oncologist, Dr. Benton, had “established through research, examination and opinion a nexus of connection between [his] disability and low-level EMF exposure from EMF-emitting invoicing tools.” Friedman letter to MHRC at 5 (Joint Record, ECF 137-11 at 5).

Response: Qualified. That statement reflected Mr. Friedman’s understanding at the time based on conversations with Dr. Benton.

113. In 2021, CMP petitioned the Maine Public Utilities Commission for permission to waive the opt-out fee for Mr. Friedman personally. Friedman Depo. at 81:7-11 (Joint Record, ECF 137-20 at 21).

Response: Admitted.

114. Mr. Friedman opposed CMP’s request. Friedman Depo. at 81:12-13 & 83:21-84:1 (Joint Record, ECF 137-20 at 21).

Response: Admitted.

115. Part of the reason Mr. Friedman opposed CMP's request was his belief that the opt-out might not be permanent, if another company bought CMP. Friedman Depo. at 84:6-22 (Joint Record, ECF 137-20 at 21).

Response: Admitted.

116. Part of the reason Mr. Friedman opposed CMP's request for permission to waive the opt-out fee for him personally was that he "want[s] to see a federal court ruling on this." Friedman Depo. at 84:6-25 (Joint Record, ECF 137-20 at 21).

Response: Admitted.

117. In support of his claims in this action, the Plaintiff has designated three expert witnesses who are expected to testify at trial: Erik Anderson, Paul Heroux, Ph.D., and David Carpenter, M.D. ECF 124 at 2.

Response: Admitted.

118. Erik Anderson is an electrical engineer. Anderson Depo. at 9:16-18 & 65:15-18 (Joint Record, ECF 137-16 at 3 & 17).

Response: Admitted.

119. Mr. Anderson has submitted an expert report in which he made the following assertions concerning the electrical transmissions associated with smart meters

RF Emissions from the Transmitting Antennas:

The RF antennas that wirelessly transmit the consumer's electrical power usage data to the utility company typically use frequencies in the 900 MHz and 2.45 GHz ranges. CMP meters use approximately 2.45 GHz. These emissions are intense and can occur often, up to 190,000 times a day. From my experience and testing done by others, these meters transmit more times than the electric companies report. This can easily be shown by measuring the emissions with a simple RF meter.

"Isotrope Wireless," which provides industry and municipalities with design, specification, evaluation, and construction support for wireless facilities, tested smart meters in three houses. This testing showed that RF

emissions from the smart meters' transmitting antennas could be detected throughout the house and were "well above" the ambient RF radiation levels. These pulsed RF emissions exceed the absolute energy output limits stated in Federal Communications Commission ("FCC") guidelines (if the emissions are not averaged over a 30-minute exposure as prescribed by those guidelines).

RF from Wireless Antennas Enter the House's Electrical System:

The Isotrope testing also showed that the house's electrical wiring conducted substantial levels of the RF emissions at 915 MHz – the communications-related frequency for those meters (in NYS) – and this frequency was then radiated from outlets (electrical power delivery points) and along the house wiring (branch circuitry). The electric smart meter is connected to the incoming power lines of the home. The power to run the electric smart meter is derived from the power lines connected to the home. The RF noise generated by the electric smart meter is then transmitted along the electrical wiring within the home along with the supplied electrical power. The wiring of the home acts as a direct transmitter of the RF noise and as an antenna broadcasting the RF noise. In this fashion, the wiring within the home becomes a whole house antenna for the RF noise.

Thus, the pulsed RF emissions from the smart meter's transmitting antenna not only enter the house wirelessly through the air, but also enter into, and are conducted along, the home's electrical wiring.

RF "Noise" From the Switch Mode Power Supply:

Other RF frequencies, besides the RFs from the transmitting antennas, also enter the house electric system. In my testing I have witnessed and analyzed smart meters' effects on the incoming electrical power voltage waveform. These frequencies are a byproduct of the AC/DC conversion process which is done by the Switch Mode Power Supply ("SMPS"). The conversion process is necessary because the utility service delivers alternating current whereas the electrical components in smart meters use direct current.

SMPS converts the 240 Volt AC power coming into the meter from the main power transformer, into the much lower DC voltage that the electronic devices require to function. The rapid back-and-forth conversion process used to remove the "alternating" aspect creates unintended RF frequencies. The on/off, back-and-forth, pulses can occur up to 150,000 times per second, which means frequencies of up to 150,000 Hz (150 KHz¹¹), are created. These kilohertz frequencies are within the RF band of frequencies. Most of the observed "noise" spikes are in the range of 2 to 50 kHz (2,000 to 50,000 Hz). The switching RF "spikes" are variable, and they are being

imposed on the 60 Hz house electricity waveform creating significant unintended RF “noise.” The RF “noise” distorts power quality and can also be described as “dirty” electrical power or “dirty” electricity.

These frequencies are present all the time but are worse when less electricity is being used (e.g., at night) and when the smart meter’s electronics need more power, for example, when transmitting RF bursts to the utility. These RF transmission bursts cause spikes over the electric wiring, and they are created because the SMPS has to suddenly supply more DC power.

Anderson Depo. Exhibit 2 at 4-5 (Joint Record, ECF 137-17 at 6-7).

Response: Admitted.

120. The study Mr. Anderson cited in his report as authority for the proposition that smart meters can be expected to emit RF signals at levels which exceed FCC standards (hereinafter “the Sage Associates report”) describes modeling of expected RF exposures under certain assumed conditions, not the results of testing of actual RF signal or exposure.

Anderson Depo. at 43:25-44:24 (Joint Record, ECF 137-16 at 11).

Response: Qualified to the extent that this implies that the Sage Associates Report was the only study cited by Mr. Anderson.

121. Mr. Anderson does not know whether the Sage Associate report was peer-reviewed.

Anderson Depo. at 44:25-45:1 & 46:6-11 (Joint Record, ECF 137-16 at 11-12).

Response: Admitted.

122. Mr. Anderson does not know who actually authored the Sage Associates report or what the authors’ credentials are. Anderson Depo. at 46:6-11 (Joint Record, ECF 137-16 at 12).

Response: Admitted.

123. The Sage Associates report assumed a smart meter operating with a 100% duty cycle. Anderson Depo. at 47:9- 48:6 (Joint Record, ECF 137-16 at 12).

Response: Denied. The Sage Associates report calculates exposure at various duty cycles and 10% intervals.

124. The Sage Associates report assumed that conducted emissions could produce a “reflection” of RF emissions of up to 2000%. Anderson Depo. at 48:9-15 (Joint Record, ECF 137-16 at 12).

Response: Admitted.

125. Mr. Anderson is unfamiliar with the basis for the assumptions in the Sage Associates report that conducted emissions could produce a “reflection” of RF emissions of up to 2000%. Anderson Depo. at 48:16-19 (Joint Record, ECF 137-16 at 12).

Response: Admitted.

126. The Isotope Wireless report cited by Mr. Anderson, which describes conducted RF emissions in three residences in upstate New York, does not describe conducted emissions which would exceed the FCC standard (and he would not expect that to occur). Anderson Depo. at 63:22-64:6 (Joint Record, ECF 137-16 at 16).

Response: Qualified, as the Isotope Wireless report does document emissions about the FCC standard 30-minute average.

127. In the Isotope Wireless report, it was reported that the degree to which conducted RF emissions were re-radiated varied from house to house. Anderson Depo. at 63:16-21 (Joint Record, ECF 137-16 at 16).

Response: Admitted.

128. The term “dirty electricity” is not a technical term. Anderson Depo. at 64:7-19 (Joint Record, ECF 137-16 at 16).

Response: Admitted.

129. Mr. Anderson has no basis for believing that “dirty electricity” is hazardous to human health. Anderson Depo. at 65:15-18 (Joint Record, ECF 137-16 at 17).

Response: Qualified. Not disputed, but Mr. Anderson cannot make such an assertion because he is an electrical engineer.

130. Mr. Anderson has never espoused the position that anyone should not have a smart meter. Anderson Depo. at 12:25-13:3 (Joint Record, ECF 137-16 at 3-4).

Response: Admitted.

131. Mr. Anderson has never seen the field study produced by Exponent or the one that was performed for the Office of the Public Advocate (in the MPUC case), which examined the levels of RF emitted by CMP smart meters. Anderson Depo. at 25:1-6 (Joint Record, ECF 137-16 at 7). 132.

Response: Admitted.

132. In Dr. Heroux’s opinion, the RF emitted by smart meters generates reactive oxygen species, which in turn alter the mitochondrial genome. Heroux Depo. at 28:14-30:14 (Joint Record, ECF 137-24 at 7-8).

Response: Admitted.

133. Everyone who is exposed to RF has increased levels of ROS in their body. Heroux Depo. at 36:18-24 (Joint Record, ECF 137-24 at 9).

Response: Admitted.

134. Dr. Heroux acknowledges that even if cells can be affected by RF, that does not necessarily transmit or translate into a health hazard. Heroux Depo. at 63:6-13 (Joint Record, ECF 137-24 at 16).

Response: Admitted.

135. Dr. Heroux's opinion on the issue of general causation – that RF exposure can promote cancer – is based on two studies: Yakymenko et al. (2016) and Khansari et al. (2009). ECF 124 at 13.

Response: Qualified. Not disputed that his opinion is based on those studies at least in part, but disputed to the extent that this statement implies that his opinion is not informed by other sources and his extensive career working in the field.

136. In fact, none of the studies reviewed by Yakymenko et al. demonstrated a direct causal relationship between RF exposure and any specific disease or adverse health effect. Mezei Declaration ¶25.

Response: Denied. Yakymenko, et al, reviewed approximately 100 studies, some of which found a causal connection between RFR exposure and increased oxidative stress or Reactive Oxygen Species.

137. Because Khansari et al. did not study subjects who were exposed to RF fields, the Khansari study provides no information on any potential adverse effects of RF fields on human health. Mezei Declaration ¶26-27.

Response: Denied. Khansari, et al, draws a connection between cancer and oxidative stress..

138. Dr. Heroux is not competent to testify about the effect exposure to RF would have on Ed Friedman's cancer. ECF 124 at 14

Response: Qualified. Admitted that this reflects the Court's ruling, but it is a legal, not factual, finding. Denied insofar as necessary to preserve the issue.

139. In Dr. Carpenter's opinion, humans are biologically affected continuously by unavoidable exposure to RF from the earth, from the sun, from radio, from television, and from other sources. Carpenter Depo. at 61:24-62:3 (Joint Record, ECF 137-13 at 17).

Response: Qualified. Not disputed as a general statement, but disputed to the extent that this statement implies that those additional sources are of the type and degree to affect the human body in the same manner as a smart meter.

140. In Dr. Carpenter's opinion, there are biological effects at any level of exposure to RF. Carpenter Depo. at 61:8-25 (Joint Record, ECF 137-13 at 17).

Response: Admitted.

141. Dr. Carpenter acknowledges that biological effects from exposure to RF do not necessarily translate into a human disease or hazard. Carpenter Depo. at 59:10-61:12 (Joint Record, ECF 137-13 at 17).

Response: Admitted.

142. Dr. Carpenter does not know at what level of RF exposure there is a clearly defined adverse human health effect. Carpenter Depo. at 57:16-59:20 (Joint Record, ECF 137-13 at 16-17).

Response: Admitted.

143. In Dr. Carpenter's opinion, the generation of reactive oxygen species is the basic mechanism by which non-ionizing electromagnetic fields cause biological effects on the human body. Carpenter Depo. at 81:11-18, 83:20-84:8 & Carpenter Deposition Exhibit 8 (Joint Record, ECF 137-13 at 22-23).

Response: Admitted.

144. In Dr. Carpenter's opinion, there is some evidence that the superimposed rapid rises and falls of sine waves (described by Anderson as "dirty electricity") generate reactive oxygen species, and cause adverse health symptoms. Carpenter Depo. at 89:9-21 (Joint Record, ECF 137-13 at 24).

Response: Admitted.

145. In Dr. Carpenter's opinion, the rapid rise and fall of the information superimposed on the sine wave, as opposed to the "natural sine wave" itself, causes adverse health symptoms. Carpenter Depo. at 88:12-89:21 (Joint Record, ECF 137-13 at 24).

Response: Admitted.

146. Dr. Carpenter does not know of a good explanation for why rapid pulsing of electromagnetic energy would generate reactive oxygen species more than the sine wave. Carpenter Depo. at 88:6-11 (Joint Record, ECF 137-13 at 24).

Response: Admitted.

147. Dr. Carpenter believes that "dirty electricity" produced by the magnetic fields of power lines has been related to the risk of leukemia in children. Carpenter Depo. at 88:24-89:8 (Joint Record, ECF 137-13 at 24).

Response: Admitted.

148. ELF and RF fields interact with body tissues (and other types of matter) very differently from one another. Cotts Declaration ¶24.

Response: Qualified to the extent that this implies that there are not also similar effects.

149. The difference in frequency between ELF fields and RF fields is so vast that there is no overlap in the biological effects of these two sources and therefore they are subject to completely separate health and safety standards. Cotts Declaration ¶24.

Response: Denied. While there may be a frequency difference and different standards, the biological effects can be similar or identical.

150. Biological exposure standard limits of ELF fields protect against nerve induction in the form of very small electric fields in body tissue. Cotts Declaration ¶25.

Response: Qualified, as these standard limits are currently under review.

151. Biological exposure standard limits for RF fields are based upon protecting against tissue heating. Cotts Declaration ¶25.

Response: Admitted.

152. Because of the vast differences in the frequencies of ELF and RF fields, studies of human exposure to ELF fields such as those produced by power lines and similar sources are not biologically relevant to studies of RF fields, and vice versa. Cotts Declaration ¶25.

Response: Denied. While there may be a frequency difference and different standards, the biological effects can be similar or identical.

153. Dr. Carpenter believes the risk of leukemia in children, and the risk of other diseases, is increased by exposure to the rapid rises and falls of sine waves produced by power line magnetic fields, a phenomenon which he believes contributes to the generation of reactive oxygen species. Carpenter Depo. at 88:24-89:21 (Joint Record, ECF 137-13 at 24).

Response: Admitted.

154. Dr. Carpenter's theory, that the superimposition of high peaks on sine waves makes RF emissions generated by smart meters potentially hazardous, has not been proven. Carpenter Depo. at 89:22-90:2 (Joint Record, ECF 137-13 at 24).

Response: Admitted.

155. In Dr. Carpenter's opinion:

- a. Radiofrequency fields cause the generation of free radicals in reactive oxygen species;

- b. The generation of free radicals in turn causes damage to proteins, carbohydrates, and DNA; and
- c. The damage to DNA can cause mutations, cancer, and birth defects.

Carpenter Depo. at 61:13-20 (Joint Record, ECF 137-13 at 17).

Response: Admitted.

156. Dr. Carpenter believes it is biologically possible that RF emissions from a smart meter could cause harm to a human being. Carpenter Depo. at 96:17-25 (Joint Record, ECF 137-13 at 26).

Response: Admitted.

157. Dr. Carpenter believes that everyone in the world is at some heightened risk of harm if they have a smart meter. Carpenter Depo. at 99:1-4 (Joint Record, ECF 137-13 at 27).

Response: Admitted.

158. Dr. Carpenter is aware of no published article that describes the phenomenon of a person suffering harm from the generation of reactive oxygen species as a result of exposure to a smart meter. Carpenter Depo. at 93:14-94:2 (Joint Record, ECF 137-13 at 25).

Response: Admitted.

159. Dr. Carpenter does not know what the health risks are of having smart meters. Carpenter Depo. at 63:8-18 (Joint Record, ECF 137-13 at 18).

Response: Denied. Dr. Carpenter cited several health risks throughout his deposition, for instance that “exposure to radiofrequency radiation is likely to reduce the interval of time when you are in remission.” Joint Record, ECF 137-13 at 11.

160. In support of his opinion on general causation – i.e., that RF can have a “deleterious effect on human health” – Carpenter “relies on two studies that examined the relationship between magnetic field exposure and survival rates among children previously diagnosed with leukemia.” ECF 124 at 9-10.

Response: Admitted.

161. In both of the leukemia studies relied on by Dr. Carpenter, the exposure of interest to the investigators was exposure to extremely low frequency (ELF) electromagnetic fields, not exposure to RF. Mezei Declaration ¶15.

Response: Admitted.

162. Because neither of the leukemia studies relied on by Dr. Carpenter examined children exposed to RF fields, neither constitutes evidence of any relationship between exposure to RF fields and survival in persons with leukemia. Mezei Declaration ¶¶16-17.

Response: Qualified to the extent that this implies that exposure results to ELF and RF cannot be similar.

163. The two leukemia studies relied on by Dr. Carpenter report only a statistical association, and not a causal link, between exposure to a specific frequency range of EMF and shorter survival in children with leukemia. Mezei Declaration ¶¶18-21.

Response: Admitted.

164. Neither of the leukemia studies relied on by Dr. Carpenter constitute reliable evidence of a causal connection between RF exposure and the promotion of cancer. Mezei Declaration ¶¶14-23.

Response: Denied. This is argument, not a statement of fact.

165. The fact that lower frequency emissions may be transmitted through building wiring does not inform Dr. Carpenter's opinions about Friedman's exposure, because the exposure Friedman would receive in his home, remote from a smart meter, has never been measured. Carpenter Depo. at 105:13-107:19 (Joint Record, ECF 137-13 at 28-29).

Response: Admitted.

166. Dr. Carpenter is not competent to testify about the effect exposure to RF would have on Ed Friedman's cancer. ECF 124 at 8 & 11.

Response: Qualified. Admitted that this reflects the Court's ruling, but it is a legal, not factual, finding. Denied insofar as necessary to preserve the issue.

Respectfully submitted,

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